PROFESSOR TRIM'S QUICK START

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PROFESSOR TRIM'S

QUICK START WEIGHT-LOSS PROGRAM

for diabetes and blood sugar control

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Introduction

HOW TO USE *PROFESSOR TRIM'S QUICK START PROGRAM FOR DIABETES AND BLOOD SUGAR CONTROL*

The *Professor Trim's* (PT) *Quick Start Weight-Loss Program for Diabetes and Blood Sugar Control* is an introduction not only to effective and sustainable weight loss, but to a lifetime of blood sugar control management. You can read it by yourself or with your specially selected and trained PT doctor. Unlike other diabetes management books, the approach taken here places less emphasis on medication (except where absolutely necessary) and towards control of your blood sugars through lifestyle change.

You'll read here that at least one form of diabetes (Type 2) is largely preventable. By following a lifestyle in which high energy-dense food, and inactivity are easy to come by, your chances of contracting diabetes are increased. If you also happen to have a genetic predisposition for diabetes (i.e. others in the immediate family have developed it), the risks are even higher.

TYPE 2 DIABETES—IT'S (ALMOST ALL) YOUR CHOICE

If you've been told by your doctor that you have diabetes, or even high blood sugars which may lead to diabetes, you have two choices: (1) do nothing and *almost certainly* contract the full disease, which is associated with ailments like impotence, blindness, cataracts, polycystic ovaries and infertility (for women), blood vessel disease (which can lead to amputation), kidney or heart disease; or (2) change your lifestyle to include more physical activity and a modified food intake which, by reducing your weight and normalising your blood sugar and blood pressure, reduces the risks of all the above happening.

By keeping your body weight at an ideal level, you can reduce your chances of proceeding from the early stages of diabetes (termed impaired glucose tolerance or impaired fasting glucose) to the full-blown disease. By following the ideal diet and exercise program, and keeping your stress levels under control, you can even reduce the risks—without losing significant weight! Professor Trim's Quick Start approach will help you do this.

PROFESSOR TRIM'S—THE HISTORY

Professor Trim's evolved from the 'GutBuster' program, which started as a men's 'waist loss' program in 1991. GutBusters became the biggest, and most successful, men's weight-loss program in the world. It had an internationally acclaimed scientific advisory board and was consistently rated by consumer groups as among the best weight-loss programs available.

GutBusters was initially designed for men. However it soon became clear that other groups, such as women, were interested in a similar type of program, even though

their issues and needs were quite different. This led to the development of Professor Trim's programs for men and women, *Becoming Gut Less* and *Becoming Slimmer* and, in turn, these specific 'Quick Start' programs for people with special health needs.

PROFESSOR TRIM'S QUICK START WEIGHT-LOSS PROGRAMS

Some people don't find it too hard to lose weight. It's just a matter of gathering the right information about diet and exercise then putting it into practice. For these people a 'quick start' program like those in the current series will be enough. Others need information and advice that is tailored to their specific needs, as well as additional support along the way.

Several thousand Australian doctors have now had special training in weight control as part of a Post-Graduate Medical Certificate in Weight Control and Obesity Management from Sydney University. These doctors (many of whom you can find at www.professortrim.com) and the Professor Trim's Medically Supervised Weight-Loss Program, can help anyone with diabetes, or an increased risk of contracting diabetes, through a shared-care system that provides the best information available on weight loss and weight management.

As well as trained doctors, Professor Trim's offers you access to specially trained Personal Weight Coaches who provide individualised and ongoing nutrition and exercise prescription, maintenance and supervision. Personal Weight Coaches are accessed through the full Professor Trim's programs. Information about the full Professor Trim's programs are contained in the back of the book. You can also purchase these directly from your

PT doctor and work with him or her through the full twelve months of the program, or longer.

To get the greatest benefit from this Quick Start weight-loss program, first read the book. You can then find regular updates on current research and information on the Professor Trim Internet site at www.professortrim.com. In addition, at the end of each chapter in this booklet you will find an easy-to-follow summary of its contents, contained in a Professor Trim's 'Prescription Pad'. Use these summaries as your checklist for putting the program into action.

STRUCTURE OF THE PROGRAM

The information contained in this book is divided into three sections.

Part 1 provides background information about diabetes, how to measure your risks and monitor your disease. Part 2 includes specific requirements for weight management and blood sugar control through physical activity, nutrition and stress management. In Part 3 we deal with some specific considerations for diabetes and high blood sugars and look at possible alternative approaches to weight loss.

Professor Trim's Prescription Pad

- Read this booklet first and try to put the recommendations at the end of each chapter into action.
- Check in at the Professor Trim Website (www.professortrim.com).
- Check in with your Professor Trim doctor for ongoing help (if required).
- For more specific programs, and a 'personal weight coach', see the Appendix.

Part 1

Background

Chapter 1

WHAT IS DIABETES?

If you've purchased this booklet, your doctor has probably told you that you either already have diabetes, or are likely to get it if you don't make some significant changes in your lifestyle. In neither case should this be taken as a message of doom. It should be regarded as a wake-up call because, contrary to popular belief, one form of diabetes (type 2) *can* be prevented and, in many cases, blood sugars can be normalised by taking action to change certain aspects of your lifestyle and losing a modest amount of weight.

TYPE 2 DIABETES—A DISEASE OF CHOICE?

Diabetes has reached epidemic proportions throughout the world. Its prevalence in Australia has doubled in the last 20 years, with 7 per cent of the population having type 2 diabetes and a further 15 per cent being at risk of contracting the disease. Considering that this form of the disease was quite rare in the past, how has this happened?

Changes in our genes are not the answer. The gene pool in a human population changes over hundreds, more probably thousands, of years, not in one or two generations. And while 'sugar diabetes' has been known since the time of the pharaohs, it was generally the form now known as type 1 diabetes, which is brought on by

the immune system attacking the cells that make insulin in the pancreas.

Diabetes occurs in people who (for reasons to be explained later) are unable to keep their blood sugar (or glucose) in the normal range. This inability is partly determined by an individual's genes, but is also significantly influenced by body weight and lifestyle. As we will show throughout this booklet, by maintaining a normal body weight, being physically active and avoiding high energy foods it is possible to avoid or minimise the effects of a genetic tendency towards diabetes.

THE PHYSIOLOGY OF DIABETES

To understand diabetes, both type 1 and the now more common type 2, it's necessary to look first at the process of human energy metabolism. We'll do this in as simple a way as possible to set the stage for what is to come in the rest of this booklet.

In the first place, human cells, like any engine, need fuel. That 'fuel' is in the form of a substance called adenosine triphosphate, or ATP, and the most readily available source of ATP is glucose, or 'sugar' (we'll use the two terms interchangeably here). Sugar in turn comes primarily from the carbohydrates in our food, but it can also come from protein foods through a more roundabout process.

Getting sugar through the cell wall into the 'engine rooms' of the cells, to keep those cells and, by definition the human body, alive, is the core process of energy metabolism. This process is a little like putting petrol into a car: you first need a key to open the petrol cap. In getting sugar into the body's cells, the key that opens the 'cap' is the hormone insulin. As we've seen, sugar comes

from food. But where does insulin come from?

The pancreas is a small but vital organ that sits next to the liver, under the rib cage on the right-hand side of the body. Within the pancreas there are hundreds of thousands of small cells called 'beta cells' whose main role in life is to manufacture insulin and release it into the bloodstream. These cells respond to sugars from the food we have eaten, which can be simple sugars (like those in table sugar or fruit) or complex sugars (like those in bread, rice, potatoes, pasta and so on).

INSULIN-PRODUCING 'LIGHTS'

Healthy beta cells can be visualised as a stack of little 'Christmas lights' which flash on and off while they manufacture insulin. Unfortunately, it is possible for this insulin production to go wrong.

It can happen that all of the flashing lights are wiped out in one hit. This occurs in people whose immune system, for some reason, switches off all the lights at once. Injury, or major trauma to the pancreas from the disease called pancreatitis, can also do this. This results in the development of the form of diabetes called type 1 diabetes. There is currently no cure (although pancreatic transplants have recently been developed) and patients are required to take insulin by injection for life. The principles of weight management covered in this book may help people with type 1 diabetes, but you will need to talk to your doctor about your insulin dose, which may need adjusting when you make lifestyle changes.

More important from our perspective, because it can be prevented, and some times even turned around, is type 2 diabetes. There are a number of differences between type 1 and type 2 diabetes. In type 1 diabetes there is an

absolute deficiency of the insulin necessary to maintain normal blood sugar levels. In type 2 diabetes, on the other hand, some insulin is present, but the body needs far more than is available. This means that a lot more insulin is needed to get that petrol cap to open, so the fuel (sugar) can enter the cells. Taking this idea further, imagine that the petrol cap has become rusty and is therefore more difficult to open even with the right key. The reason insulin becomes less efficient is not clear, but could be due to a number of factors.

As the blood sugar level builds up in the bloodstream (because it is not being used up in energy production), the cells that make insulin start to malfunction because of what is termed 'glucotoxicity'. In other words, the flashing lights in the pancreas are put under so much pressure that they gradually start going out, one at a time, until instead of a panel of constantly flashing lights we have only the odd light flickering here and there—and insulin production starts to fall.

INSULIN RESISTANCE AND TYPE 2 DIABETES

The term used to describe the process of the lights going out and the development of type 2 diabetes is 'insulin resistance'. In the beginning at least, enough insulin is being produced, but it is not able to be effective. The associated build-up of sugar and/or fat in the bloodstream begins to 'poison' the remaining beta cells in the pancreas, and they in turn become less effective.

Insulin resistance is partly determined by genes, but it also occurs as a response to an increase in body fat, particularly increased fat around the abdomen, and/or as a response to a decrease in physical activity. Increases in

body fat, and particularly decreases in physical activity, have become a part of life in modern technological societies, and together help to explain the huge rise in type 2 diabetes.

The good news is that the time lag between the early signs of the petrol cap becoming harder to open, and all the lights going off in the pancreas, is probably about ten years, and is therefore sufficient to allow lifestyle adaptations to be made.

Insulin resistance and diabetes are the gateways to several other severe forms of disease. About 80 per cent of deaths in people with type 2 diabetes are from heart disease. Insulin resistance is also related to conditions such as high blood pressure, high blood fats (cholesterol and triglycerides), gallstones, fatty liver and polycystic ovaries. Insulin resistance is the link between the first externally obvious sign of ill-health, in particular extra fat stores around the abdomen, and the final diabetic disease process. Addressing some of the early signs or risks of diabetes may go a long way to preventing the onset of the disease, or at least those ailments commonly associated with it.

GENES AND TYPE 2 DIABETES

There's little doubt that there is a genetic component involved in diabetes. But type 2 diabetes is one of the best examples of the interactive effects of genes and lifestyle—it almost certainly cannot develop without a contribution from both. The good news is that by altering those lifestyle factors that encourage diabetes early enough, there is a good chance that the risk of developing diabetes can be reduced, perhaps even eliminated. Weight loss is the key factor; increased physical activity, even without

weight loss, is another important factor, and has the added benefit of also helping maintain weight loss.

Professor Trim's Medically Supervised Weight-Loss Programs are designed to prevent, and even reverse, type 2 diabetes in men and women. In this Quick Start program for those who may have already been diagnosed with type 2 diabetes, or who have a recognised risk of the disease, the basics of how to lose weight are considered.

A WORD ABOUT TYPE 1 DIABETES

Type 1 diabetes is an auto-immune disease (a disease in which the body 'attacks itself') which is generally thought to be unavoidable. In type 1, all the 'lights' in the pancreas are eliminated at one time and it becomes necessary to take external insulin injections for life.

For people with type 1 diabetes, however, being overweight can be as much of a problem as it is for people with type 2 diabetes, even though it wasn't overweight that caused the problem in the first place. Maintaining a healthy body weight and regular physical activity will help those with type 1 diabetes keep tighter control of their blood sugar and therefore reduce the chances of complications later in life. To do this effectively you will need to work closely with your doctor to manage your insulin, as the appropriate dose will vary with changes in diet and exercise. The means of weight loss discussed in this booklet apply equally to both types of diabetes.

Professor Trim's Prescription Pad

- Read this booklet if you have been diagnosed as having diabetes, or the pre-cursor of diabetes, particularly if you are overweight.
- Follow the nutrition, exercise and stress management suggestions in later chapters.
- Work with your doctor, or one of Professor Trim's doctors, to help manage, and possibly eliminate, your diabetes.
- If you have type 1 diabetes, follow the instructions on food and exercise, but discuss what you are doing with your doctor so changes can be made to your insulin dosage.

Chapter 2

MEASURING YOUR DIABETES RISK

WHAT DEFINES DIABETES?

Diabetes refers to a condition where a person's blood sugars are above a defined upper safety level of 7.0mmol/L in the fasted state, or 11.0mmol/L after eating. However, it is possible to have diabetes when blood sugars are below these levels, which is why, if your doctor thinks you may be at high risk, he or she might perform a glucose tolerance test (see below).

Diabetes it is a relatively 'silent' disease which has no obvious symptoms in the early stages. As it progresses, however, diabetes can cause excessive thirst and hunger, frequent passing of urine (particularly during the night), tiredness, blurred vision, skin infections, failure of wounds to heal and, in severe cases, coma. If the disease is not controlled, in the long term it can lead to heart disease, blindness, kidney failure and blood vessel disease, which can sometimes result in the amputation of a limb.

Early recognition of the problem is therefore important. There are a number of ways of: (a) measuring the risk of developing diabetes, so it can be prevented in the first place, and (b) measuring the problem itself, so it can be better managed. In both instances, achieving a healthy body weight and becoming more active are the primary means of dealing with the problem. In this chapter we will look at the measures available, and in

following chapters at ways of managing the problem through achieving a healthy body weight.

Measuring the risk

This is a simple pencil and paper test for measuring your risk of contracting diabetes. To find out your risk (if you haven't already been diagnosed as having it), simply tick the boxes next to each statement that is true for you.

	YES	NO
1. I am a woman who had diabetes in one or more of my pregnancies	☐	☐
2. I am a woman who has had a baby weighing more than 4kg at birth	☐	☐
3. I have a sister or brother with diabetes	☐	☐
4. I have a parent with diabetes	☐	☐
5 . (a) If female:		
My body mass index (BMI)[1] is over 35	☐	☐
or		
My waist circumference[2] is over 88cm	☐	☐
(b) If male:		
My body mass index (BMI)[1] is over 35	☐	☐
and		
My waist circumference[3] is over 102cm	☐	☐
6. I am generally sedentary or inactive during my work and leisure time	☐	☐
7. I am between 45–64 years of age	☐	☐
8. I am over 65 years of age	☐	☐

[1] Body Mass Index = weight (in kilograms)/height (in metres^2). Ask your doctor to calculate your BMI.

[2] If Caucasian; over 80cm if Indian or Asian; over 100cm if Pacific Islander.

[3] If Caucasian; over 90cm if Indian or Asian; over 110cm if Pacific Islander.

If you answered Yes to two or more of these questions you are at high risk for developing diabetes. You will need to try and keep your weight down by being both physically active and reducing your energy intake.

If you ticked less than two questions, your risk is reduced. But don't just forget about it. Keep that risk low by losing weight, being active on most days, and eating low fat meals that are high in fruits, vegetables and wholegrain cereals.

Facts about diabetes

- Over 1 million Australians were diagnosed as having diabetes in 2001.
- 16 per cent of the overall Australian population have impaired fasting glucose, which is a condition that precedes diabetes. In terms of the adult population, this means that 25%, or 1 in 4, either have, or are in line to get, diabetes.
- Diabetes is one of the fastest growing non-infectious disease epidemics around the world; it is increasing at the rate of around 1 per cent per year in Australia.
- Type 2 diabetes makes up more than 85 per cent of all cases of diabetes. The risk factors are obesity, inactivity and genetics. However, many cases are preventable by maintaining a low body weight and keeping fit.
- Obesity is estimated to cost 5–10 per cent of the total annual health bill, or around $3–4 billion per year, in Australia alone. Diabetes is usually the first metabolic problem resulting from obesity, and is the most costly disease

associated with it, accounting for approximately 4–5 per cent of the annual health budget.

- In the USA, total annual health care costs for a diabetic patient, from no drug treatment to treatment with insulin, have been estimated as ranging from US$4400 to US$7365. This is the equivalent of around $9000 to $14000 annually per patient in Australia.
- The main complications from diabetes include heart disease, amputation of a limb, blindness, kidney failure, impotence and erectile dysfunction (in men) and skin disorders.
- Two recent large-scale international studies have shown that even after the first signs of impaired glucose, around 50 per cent of diabetes can be prevented by lifestyle change with weight reduction.

MEASURING THE DISEASE

There are several tests for measuring whether you have diabetes and how well it is controlled. These include:

Fasting plasma glucose (FPG)

This is a standard blood test done by your local doctor. It can show to what extent blood sugars are not being taken up in the cells of the body. You will need to have a blood sample taken first thing in the morning after not having eaten for at least eight hours. If your blood sugar reading is above 7mmol/L you have diabetes. If your fasting blood sugar is between 6.0 and 6.9mmol/L, you may be asked to do another test at a later date. Sugar levels of between 6mmol/L and 6.9mmol/L are defined

as impaired fasting glucose (IFG), which carries a risk of converting to diabetes, but the risk can be reduced with weight reduction and physical activity.

Oral glucose tolerance test (OGTT)

An OGTT test measures the rate at which glucose (sugar) in the blood returns to normal after a set amount of glucose intake. This gives a dynamic measure of the metabolic uptake of sugars. You will be given a 75g glucose-rich drink, then your blood sugars will be measured after one hour and two hours. If sugar levels are high after two hours (greater than 11.0mmol/L), this indicates diabetes.

A post-drink glucose level between 7mmol/L and 11mmol/L is classed as having impaired glucose tolerance (IGT). The desirable level lies between 5mmol/L–6.9mmol/L. It is well known that people with IGT have an increased risk of diabetes—in fact, approximately 1 in 3 will go on to develop diabetes within about ten years. Again, at this stage, weight loss, exercise and diet change can reduce the risks of developing diabetes. However, depending on the severity of risk, and your motivation to deal with the problem without drugs, your doctor may decide to start you on a form of diabetic medication. Lifestyle changes, through weight loss and physical activity, however, are more effective in preventing diabetes at this stage than the medication (metformin) that is sometimes used.

Glycosylated haemoglobin test (HBA_1C)

Once you are diagnosed with diabetes, your doctor will regularly use the HBA_1C or glycosylated haemoglobin

test as an indicator of your control over the disease. This test is a measure of the sugar attached to a molecule in the red blood cells. Unlike the FPG and OGTT, which indicate sugar levels at the time of measuring, HBA_1C gives an indication of blood sugar levels over the past three months. A normal HBA_1C level is less than 6 per cent. A level of between 6–7 per cent would characterise very good diabetes control. If HBA_1C is kept below 8 per cent, the chances of long-term diabetes complications such as nerve, eye and kidney damage are reduced. An HBA_1C over 8 per cent is considered poor diabetes control and requires action by you and your doctor.

Professor Trim's Prescription Pad

- Measure yourself around the waist and check against the measures given below the table on page 10.
- Complete the pencil and paper screening test to check your risk of diabetes.
- Ask your doctor for a fasting blood glucose or an oral glucose tolerance test if you suffer any of the symptoms of diabetes.

Chapter 3

DIABETES, THE METABOLIC SYNDROME AND THE 'M AND M' SYNDROME

As we have seen, diabetes can be a major health problem on its own. However, diabetes is just one outcome of a group of symptoms characteristically associated with insulin resistance which is commonly referred to as syndrome X, or the 'metabolic syndrome'.

The metabolic syndrome is now widely recognised among medical practitioners. It describes a cluster of risk factors such as high blood pressure, adverse blood fats (e.g., high cholesterol), high blood sugars, high levels of insulin in the blood and abdominal obesity, which often precede other diseases, including diabetes and heart disease. The metabolic syndrome is being seen more and more in general practice and at least one Australian GP has suggested a wider explanation of the components of the syndrome.

'While there's no doubt that the metabolic syndrome is important,' says Dr Andrew Binns, Executive Director of the Northern Rivers Division of General Practice and a prominent practitioner in lifestyle-based diseases, 'there's a second, and possibly a third, factor associated with all of this which also need to be taken into consideration.'

Dr Binns is referring to the mechanical disorders—such as sore joints, breathing problems and sleep apnoea—often associated with the abdominal obesity

Metabolic and mechanical problems associated with the metabolic syndrome

Relative risk	Metabolic disorders	Mechanical problems
Greatly increased risk (i.e. RR>3)	Type 2 diabetes Fatty liver Hypertension Dyslipidaemia Insulin resistance	Sleep apnoea Breathlessness* Asthma* Social isolation/ depression Fatigue/daytime sleepiness*
Moderately increased risk (i.e. RR 2–3)	Coronary heart disease Stroke Gout/Hyperuricaemia	Osteo-arthritis* Respiratory disease* Psychological problems
Slightly increased risk (i.e. RR 1–2)	Cancer (breast/ endometrial/colon and others) Reproductive problems Impaired fertility Polycystic ovaries Skin complications Cataract	Varicose veins Musculo-skeletal problems* Bad back* Stress incontinence* Oedema/ cellulitis*

* Likely to negatively affect motivation to be active

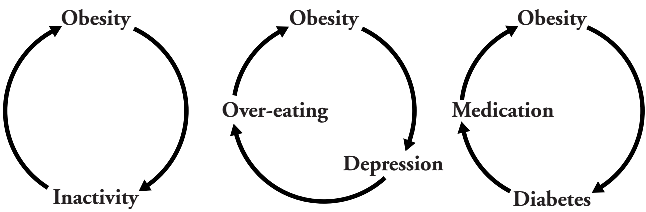
which so often leads to the metabolic syndrome and then to diseases such as diabetes.

'Often we are required to deal with the metabolic effects of the metabolic syndrome, such as high blood pressure, blood sugars and dyslipidaemia (adverse blood fats),' says Dr Binns, 'when the most obvious treatment for these, increasing activity, is hindered by sore knees or a sore back which are caused by being overweight.'

Dr Binns uses the term ‘M and M syndrome’ to describe the metabolic and mechanical problems resulting from modern inactive lifestyles. He points to a number of different problems (see table on page 16) within each of these different categories and says they all have to be considered when dealing with a patient.

M AND M—AND M?

Because of the mechanical problems resulting from the M and M syndrome, it might be necessary to add another M, for ‘motivation’. Mechanical problems like asthma, heavy breathing, tiredness and in some cases what is thought to be ‘arthritis’ of the lower leg joints, reduce the motivation to adopt the appropriate treatment options. This means that the problem can become a ‘vicious cycle’ which ultimately can make it worse. Some other examples of vicious cycles like this in obesity are shown in the diagram.



Being overweight, for example, can lead to mechanical problems, which lead to inactivity and, in turn, further obesity. It can cause depression, which results in further over-eating and more obesity. Finally, as the third cycle in the diagram shows, obesity can cause diabetes, leading to a requirement for medication. However, some

diabetic medications can result in further weight gain. So, we have to look to breaking these cycles if we are to have any effect on body weight and diseases such as obesity.

ALTERNATIVE OPTIONS

If being overweight causes joint problems, which in turn reduce the motivation to become active, other approaches to dealing with overweight must be considered. An example for people with lower limb problems, which they often think of as arthritis, is walking in waist-deep water to take the pressure off the joints.

As we'll see, physical activity can decrease the need for diabetic medication and hence increase the prospects for weight loss, which can help manage diabetes. It's this knowledge and little tricks like these to which we will now turn to help reduce weight and decrease the severity of diabetes.

Professor Trim's Prescription Pad

- Get your Professor Trim's doctor to test for the metabolic syndrome.
- Be aware of the potential mechanical problems that can come from being overweight.
- Be aware of the effects these problems can have on your motivation to lose weight.
- Look to alternative ways of breaking into the vicious cycles of weight gain.

Chapter 4

WHAT'S WEIGHT GOT TO DO WITH IT?

The question you might be asking as you read this book is: 'Why should I be interested in losing weight when my problem is diabetes, or high blood sugars?'

The simple answer is that being overweight is one of the major risk factors for diabetes. However, it's not just *if* you are fat, but also *where* you are fat, that is important. People who carry their fat around the waist, in an apple shape, are at far higher risk than those who carry it around the hips and buttocks, in a pear shape. In fact, it's now known that weight on the hips and bottom tends to protect against the development of diabetes.

Why abdominal fat has a greater risk of causing diabetes is not clear. What is known is that this fat, and particularly the fat stored around the viscera (organs) of the trunk, such as the liver, kidneys and stomach, is much more 'active' than fat stored lower down. In other words, fat is constantly leaching out into the bloodstream from these visceral sources. This exposes all the major blood vessels to harmful fats and causes damage such as hardening of the arteries, also called atherosclerosis. Think of it like mud in a hose. If there is too much mud it tends to block up the hose and cause the water (blood) to stop flowing, thus putting pressure back on the pump (heart).

But this mechanical explanation is only part of the story. Of even greater concern is the effect that increasing

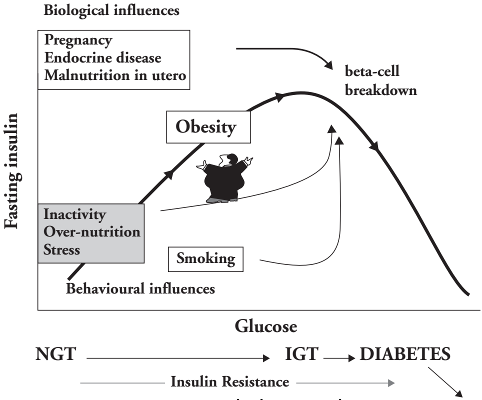
visceral and abdominal fat has on the action of insulin in assisting glucose (sugar) into all the cells of the body. As explained in Chapter 1, type 2 diabetes develops from insulin resistance, where the insulin produced by the pancreas is less effective in opening the cell wall to allow sugar in. How this happens is not exactly clear, but it is known that increased fats in the bloodstream are associated with the increasing failure of insulin to do its job. Fat loss from the abdominal region can have a dramatic effect in reducing insulin resistance and lessening the associated risk of diabetes.

In some ethnic groups, the amount of visceral and abdominal fat as a percentage of total body fat is greater or less than that in Caucasians, meaning that the risk of diabetes can vary at a particular overall level of fat. For Caucasians, as shown in the screening test in Chapter 2, a waist circumference of around 100cm for men and 90cm for women is regarded as a cut-off point above which the risk of diabetes increases. Indians and Asians have more visceral fat as a percentage of total body fat, hence their comparative waist circumference cut-off points are lower, around 90cm for men and 80cm for women. Pacific Islanders are generally bigger people, whose abdominal fat is less as a percentage total body fat, and hence their cut-off points are thought to be around 110cm for men and 100cm for women (although this is not yet proven).

WHAT HAPPENS WITH INCREASING WEIGHT?

The following diagram demonstrates the relationship between increasing weight (and thus increasing metabolic impairment) and the progression to diabetes.

Increasing metabolic impairment with increased weight



* NGT = Normal glucose tolerance
IGT = Impaired glucose tolerance

Along the bottom line of the graph are increases in blood sugar. In a healthy individual blood sugar is kept relatively constant as insulin is produced to help use it up in the body's cells. In this case there would be no curve in the graph. With increasing weight (and some of the other causes shown on the graph, such as inactivity, bad nutrition and stress), insulin becomes less effective, and so the amount of insulin builds up in the bloodstream as more is produced to compensate for its inefficiency. Beyond a certain point, the pancreas is unable to continue to produce insulin. Insulin levels in the blood then start to decrease, even with excessively high glucose levels. At this stage, external insulin may be needed to normalise blood sugar levels.

WHY DO ANYTHING ABOUT WEIGHT?

Being overweight is the main cause of the rise and then decline in insulin production. Consuming a high energy diet and being inactive can be *dependent* causes because,

linked together, they can lead to obesity and thus to diabetes. Either inactivity or smoking can lead to a breakdown in insulin production *independently* of an increase in weight. In other words, while most type 2 diabetes is caused by being overweight, some cases will be due to inactivity or smoking—without an increase in weight.

Because each of these lifestyle factors has an impact on body weight, it is being overweight to which we now need to turn. Reducing your weight can have a profound effect on your risk of developing diabetes. If you have diabetes, reducing weight (and getting active) may mean you can reduce your medication dose; you might perhaps be able to stop taking some of your medication. Reducing your weight (and/or becoming active) may even mean that your glucose levels return to within the normal range.

You might also find that reducing your weight means that your blood pressure and blood fats improve and so you may be able to reduce or even come off blood pressure and lipid-lowering medication. But how much weight do you need to lose for this to happen?

HOW MUCH WEIGHT LOSS IS NECESSARY?

When most people think about weight loss they think they should reduce to the weight they were in their teens or early twenties. This is not only unrealistic, but also unnecessary. Studies have shown that a 5–10 per cent decrease in body weight can make a big difference to diabetes control, blood pressure control and blood fat levels. In some cases, if you become much more active (even if you don't lose weight), diabetes control can improve significantly. Hence a sensible approach to weight loss for diabetes control is a 5–10 per cent decease in weight and a significant increase in physical activity (which will also help weight loss). By

losing a modest amount of weight, most people will be able to reduce their diabetic medications or insulin doses. A modest weight loss can also go a long way towards helping blood fat (cholesterol and triglycerides) and blood pressure control. The need for medications for these conditions can also be reduced.

At least five major studies carried out around the world have compared the effects of changes in lifestyle with diabetic medication in the control of early stage diabetes. These have consistently shown a 50–60 per cent decrease in the risk of contracting type 2 diabetes with a change to a healthy diet and increased physical activity—even in people with pre-diabetic symptoms (such as impaired fasting glucose). Medication, on the other hand, is shown to be only half as effective.

Most medical practitioners will therefore concentrate on the cornerstones of weight loss (nutrition, physical activity and stress management) to deal with the problem of overweight before reaching for medication. It is these cornerstones to which we turn in the following chapters.

Professor Trim's Prescription Pad

- Aim to reduce abdominal fat (around your waist) as much as to reduce body weight to avoid diabetes.
- Small losses in weight (5–10 per cent) will result in very significant health improvements.
- Look to changes in lifestyle (food and physical activity in particular) for long-term blood sugar control.
- Decrease the risk of diabetes by becoming more active—even in the absence of significant weight loss.

Part 2

Weight loss management

Chapter 5

YOUR NEW SECRET WEAPON AGAINST DIABETES

In most weight-loss books, the accent is on dieting. Hence you might expect to find that the first practical chapter in this book on weight control for diabetes would be on what you *shouldn't* eat. But there are a number of misconceptions inherent in this traditional approach.

In the first place, dieting implies strictly limiting food intake in some way or another. By definition, *going on* a diet means *coming off* it at some. And because diabetes is a lifetime disease, a short-term solution like this is not likely to work. So, even when we start to talk about nutrition (in Chapter 7), we'll avoid the term 'diet'.

More tellingly, it has now been established that while nutrition is important for weight loss and diabetes control, we have not fully understood the importance of exercise or, more correctly, physical activity. Indeed, the history of diabetes treatment has been largely oriented around changing diet, with only token emphasis given to increasing activity levels. In the 1960s, for example, it was thought that diabetes was due solely to an excess of sugar in the diet. The name *diabetes mellitus* actually means 'sugar diabetes' and it was taken literally. In the 1980s, fat in food became the culprit because it was thought that this increased body fat most and therefore

led to diabetes. But dietary fat is only one cause of increased body fat. In the 1990s it became clear that *any* method of reducing body fat would be valuable in diabetes management.

THE RISE IN IMPORTANCE OF 'MOVEMENT'

It has recently been established that a single bout of physical activity increases the body's sensitivity to insulin for the following 24 hours or so. For this reason, physical activity has now become one of the cornerstones of diabetes management. This is how it works. Increases in sugar in the blood lead to an increase in insulin, which helps to 'open' the cell wall to allow sugar into the cell to be burned up as energy. This is done is by the movement within the cell of molecules (known as Glut4 molecules) to the cell wall to act as 'transporters' of sugar into the cell. In the presence of a lesser amount of insulin, physical activity has the identical effect on the Glut4 transporters as a larger amount of insulin. Thus exercise reduces the body's insulin requirements.

So physical activity plays a very important role in diabetes management. As a result, exercise scientists are rushing to their laboratories to work out what types of exercise should be carried out to get the best effects in glucose control.

We can summarise the research to date in the following ten statements:

1. One of the best types of movement for weight loss and diabetes control is walking.
2. Any increase in daily physical activity will help, but more is better than a little.

3. There are two types of activity that are vital: (a) planned, such as consciously setting out on a daily walk or exercise program, and (b) incidental, where human effort replaces that usually carried out by machines or other people.
4. Where walking is not possible or advisable (i.e. where it is painful or likely to cause complications), a weight-supportive activity like swimming, walking in water or cycling is the next best thing.
5. As capacity for exercise, or fitness, improves, there is even greater benefit in increasing the exercise effort (i.e. its intensity, duration and frequency).
6. Resistance training (e.g., weight lifting) is another form of exercise that can help in diabetes.
7. Resistance exercise should follow the more general exercise effort mentioned above, be designed specifically for the individual and progress gradually.
8. Resistance exercises should be designed to work the large muscles of the body to ensure greater glucose disposal.
9. Always check with your doctor before undertaking a new resistance exercise program. In some people with diabetic eye disease, kidney disease or blood pressure, resistance exercise may need to be avoided.
10. Stretching should be included as part of any exercise routine.

Finally, all these recommendations are based on the assumption that a good medical or specialist check has ensured that none of these activities is likely to exacerbate your particular diabetic or blood sugar condition.

We'll consider aspects of each of these ten statements in this chapter and the next.

EXERCISE (PHYSICAL ACTIVITY) FOR DIABETES

Because exercise makes insulin work more efficiently, it is important to carry it out regularly. If you have been told by your doctor that you don't yet have diabetes, but could get it in the future, a regular and progressive program of exercise could help prevent this from happening. If you have already been diagnosed as diabetic and need to take daily medication or insulin injections, regular daily physical activity can help you reduce the amount of insulin or other medications you may be taking. As some diabetic medications will make you gain weight, exercise can be of considerable advantage in helping your blood sugar control through lifestyle change.

Any increase in physical activity will help, but remember that more is better than a little. However, in starting off, you may need to talk to your doctor and start slowly. Weight-bearing exercises are best for weight loss, and none is better than walking. If your body weight or an injury makes weight-bearing exercise difficult, look to a weight-supportive activity such as cycling, swimming, or walking in water as an alternative.

PRECAUTIONS

For those with a pre-diabetic condition, an increase in daily movement levels does not make it necessary to have extensive medical tests. If you are already under the care of a GP for diabetes however, it is best to talk to him or her about your intentions before you increase your

activity levels. Special care should be taken, for example, with:

- modifying medication to cope with the change in activity (GP's advice essential);
- not going too far or fast at the outset;
- gradually increasing the volume of physical activity;
- checking feet carefully for possible injuries which may not be felt because of circulatory problems; and
- making any other checks that may be specific to your case.

HOW MUCH EXERCISE?

New research suggests it is not necessary to follow the old concept of vigorous exercise at high intensity for weight loss. Energy use is the main requirement, and this comes from all forms of *accumulated* movement (movement not necessarily all done at the one time). In essence, the issue with physical activity is 'volume', where:

Volume = Frequency × Intensity × Duration

Frequency

Ideally you should be carrying out some form of planned activity every day. Any is better than none and more is better than a little. If you can't do this, in the next chapter we'll look at how you can increase 'incidental' activity.

Intensity

If intensity of activity is increased, frequency and duration can be decreased. But where it may be potentially dangerous or disadvantageous to increase intensity,

benefits can be gained from increasing frequency and duration. This is good news for the overweight, as intense activity is often not only difficult and painful, it can also be dangerous. On the other hand, the more you move your body, irrespective of how this is done or what you are doing, the less chance it has of storing unused energy as fat. Intense activity is not necessary, at least in the early stages of an exercise program. We'll see at what level this should be in the next chapter.

Duration

The continuous duration of a physical activity program is not important for weight control—at least in the first instance. Increased accumulated movement, such as from increasing the total number of steps taken in a day, is the key issue. The greater the accumulated duration, the better. At the start, however, and if you have typically been very sedentary to this point, a total of around 30 minutes extra of mild to moderate intensity activity, such as walking, is sufficient. This can be built up to 60 to 80 minutes with increased fitness. Remember also that benefits from this level of activity also depend on at least not eating any more than currently, and preferably eating a fair bit less.

GOALS

The main goal of a weight management and glucose control program therefore should be to increase movement. This can be done in two main ways: (a) by increasing the 'incidental' activity that would otherwise be done by machines in day-to-day living, and (b) by planning to do some extra (accumulated) activity throughout the day.

Professor Trim's Prescription Pad

- Increase your general daily activity level in as many ways as you can.
- Come to see exercise as not just a weight loss tool but also as a tool for managing blood sugar levels.
- Regard physical activity as a means for maximising the action of your own insulin.
- Start extra activity slowly and build up gradually, especially if you are very overweight or have not been very active.
- Concentrate on the total, accumulated **volume** of physical activity carried out during the day, where volume can be changed by increasing frequency and duration in the first instance, and possibly by increasing intensity at a later stage (under medical supervision).
- Use physical activity to decrease the risks of diabetes or the need for medication.
- Aim to increase the volume of physical activity in the early stages by increasing frequency and duration, but not intensity.
- Talk to your doctor about any special precautions required.

Chapter 6

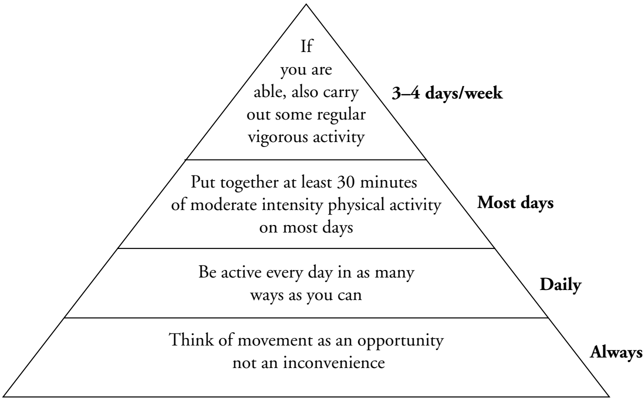
RUNNING (OR WALKING) AWAY FROM DIABETES

Because of modern technology, humans in advanced societies are estimated to be at least two-thirds less active in their daily lives today than they were 100 years ago. This means that a major goal for most people should be to increase their total daily movement—in whatever way possible. This goal is even more desirable for those with diabetes or diabetes risk factors because, as we have seen, all movement can help dispose of glucose more readily and reduce insulin resistance. If you think about it, however, those movements that involve the large muscles of the body, or that require muscles to contract continuously over an extended period, will 'soak up' the most blood sugar, and therefore be best for diabetes control as well as weight loss.

The National Physical Activity Guidelines produced by the Australian National Health and Medical Research Council encapsulate the need for increased movement in four main statements, as shown in the figure on page 34.

These guidelines were developed in 1998. Today, there is probably even less physical activity required in the 'ambient' environment than there was then, because the Internet, computers and other forms of technology have been playing a growing part in decreasing the activity levels of day-to-day life. Hence some modifications may now need to be made to these physical activity guidelines to get the best benefits. We'll discuss these as we go along.

National Physical Activity Guidelines



The two guidelines at the bottom of the pyramid refer to what is classed as 'incidental' activity. The two at the top relate more to 'planned' actions.

INCIDENTAL ACTIVITY

Incidental activity can include:

- Walking instead of driving;
- Not using remote controls (e.g., for the TV);
- Reducing the use of effort-saving machinery (e.g., leaf-blowers) and doing things by hand;
- Standing instead of sitting;
- Not using emails where walking to give someone a message is easy (e.g., in an office);
- Doing things yourself instead of asking others;
- Using the stairs instead of lifts or escalators.

At very least, the pyramid suggests that all movement should be regarded as '*an opportunity, not an inconvenience*'. It helps to consider all the things you do each

day and see how you could plan to make your day more physically active. It's a bit of a mind shift: for the past 50 years we have all been trained to be efficient in our use of time and effort. You'll need to turn this around and think of how you can 'waste' physical effort in performing your daily tasks.

Is it possible to take public transport? Could you get off the bus a stop or two earlier, park the car some distance from where you are going (or leave it at home), take the stairs instead of the lift, and so on? There are endless possibilities. In essence, increasing your activity level starts with becoming *less* physically efficient in what you do.

Now this may sound wrong—*less* physically efficient. But it is exactly what is required. It means moving more to achieve the same end. Moving more makes you burn more calories or energy (and blood sugars) throughout the day, and increases your body's ability to dispose of glucose.

PLANNED ACTIVITY

Planned activity for weight loss involves accumulating, or putting togther, as much movement as possible. What is the minimum amount required? Unfortunately, for those living in a modern industrialised society, it can be quite a lot, and for women it's probably more than required for men. The US Weight Control Registry, for example, has found that in the moderate environment a woman may need between 60 and 90 minutes of being active daily in order to lose weight, and up to 60 minutes just to maintain her weight. The good news is that this doesn't have to be all in one go.

How can you measure your level of activity? One way is by measuring the number of steps taken each day through a device called a digital pedometer, which is worn around the waist. As part of the full Professor Trim

program you'll receive one of these in your at-home weight-loss kit. You'll also be given a table to set your stepping rate to achieve weight loss at different levels. For this Quick Start program, however, it's important to understand that any amount of walking will be helpful.

COUNTING STEPS

A minimum level of 7500 steps a day just to maintain body weight will require about 30 minutes of activity, like walking, extra to the activity which you normally carry out in your daily life. The good news is that those steps don't all have to be taken at one time. For weight loss you can accumulate 5 lots of 1500 steps, or even 7500 lots of 1 step. The main thing is that it is carried out.

For the best weight loss results, research has shown that a total of over 10 000 steps, or walking 4 to 5 kilometres a day as part of your normal daily activity (roughly 60 minutes daily activity), is required. Remembering, however, that as we discussed in the previous chapter, increased *volume* of physical activity is the ultimate aim, you may decrease the duration by increasing exercise intensity or frequency, if you are fit enough. For example, jogging at a relatively high level of intensity might mean that only 30 minutes a day will be enough—provided you don't make the common mistake of being less active for the rest of the day to 'compensate' for the jogging. If you've previously been obese, you may need even more (i.e., 60–90 minutes) of planned activity to keep that weight off permanently.

VARYING INTENSITY

To economise your time, you may be tempted to increase the volume of your physical activity too soon by increasing

the intensity and decreasing the frequency or duration. In the early stages this can be a mistake, for it can put extra pressure on the heart and muscles and has the potential to create problems. Discuss with your Professor Trim's doctor or your personal weight coach the intensity you should be working at. You can use a heart rate of less than about 120 beats per minute as a general guide.

WHAT TYPE OF MOVEMENT?

Some forms of movement are better than others. But in general, we can say that it's the weight-bearing activities, that is, those in which you have to carry your own body weight, that use up the most energy. These include simple, natural movements like walking. For the average sized person, walking is one of the best types of weight loss activities, as it burns up roughly 1 kilocalorie for every 20–30 steps. It doesn't matter whether this is in the form of a planned walk, going out jogging, or just walking around the house or office.

A second recommended form of activity is resistance training or weight lifting (see Chapter 7). Recent research has shown that, contrary to earlier advice, weight training using exercises involving the large muscles of the body for a set of 10–15 repetitions, can be most helpful, not just in maintaining muscle and decreasing fat, but in helping control blood sugars in diabetes. If you are not familiar with this type of exercise it may be necessary to get advice from a qualified fitness leader or weight coach. Most fitness centres now have weight coaches available to design specialised resistance programs. Resistance training should not, however, replace all aerobic types of weight-bearing activities, because it is aerobic activities that use

up the most energy. Resistance training is best begun after initially increasing other activity levels.

Finally, it is vital to combine stretching, or flexibility training, with these other forms of activity. Weight-bearing movement and resistance training can both result in a shortening of muscles, which can ultimately cause muscle strain or tear. Increased flexibility may be obtained either through stretching individual muscle groups, or through programs such as yoga.

Professor Trim's Prescription Pad

- Move more for weight loss—as part of your daily lifestyle.
- Increase incidental exercise as much as possible.
- Carry out weight-bearing movement (e.g., walking) for weight management.
- Try to accumulate (put together) a minimum of 30 minutes of planned activity each day.
- Try to accumulate at least 10 000 steps, or 60–80 minutes, of moderate-intensity activity each day for best results—although not necessarily all at one time.
- If you are reasonably fit, the duration of activity can be decreased and the intensity increased.
- Think of movement—any movement—as an opportunity and not an inconvenience.

Chapter 7

LIFTING YOUR WAY OUT OF TROUBLE

Although diabetes has been around for thousands of years, the current epidemic of type 2 diabetes has gained ground so fast that the information required to deal with it has often lagged behind. The issue of exercise is a case in point. As discussed previously, exercise in general was for a long time under-rated as a means of treating and preventing diabetes. In the last decade the notion of exercise has gained greater acceptance, but the type of exercise prescribed did not really progress beyond the general recommendation to move more.

Since the late 1990s, however, much research into diabetes has concentrated on the most effective forms of exercise for glucose control. Results have shown that not only is aerobic activity and movement in general useful, but that exercise requiring the loading of large muscle groups—in other words resistance exercise—could be the most effective type of exercise.

This has led to a resurrection of interest in weight training for glucose management in diabetes. Instead of people with diabetes being advised not to lift weights, as has often been the case in the past, there are now moves to: (a) prescribe weight training as part of a general progression of exercise for diabetes; and (b) prescribe specific weight training regimes for individuals, tailored to their particular problems.

WEIGHT LIFTING: THE GENERALITIES

Resistance exercise can be done in many ways, including:

- Using one's own body (callisthenics);
- Using simple household items (such as bean bags or thick rubber bands);
- Using water for resistance (i.e. aquarobics); and
- Using weight-training machines or free weights.

In general, the aim is to eventually progress to the use of free weights, where muscles and joints are worked comprehensively through holding and balancing a weight in many different ways. It is not the intention of this booklet to prescribe a weight-training regime in detail. There are some basic principles, though, which should be understood before progressing to specifics under professional guidance. These include the concepts of:

- **Overload** This means that resistance at the start of any program is light, but should progressively increase as your strength increases.
- **Repetitions** This is the number of times an exercise is repeated. For weight loss and blood glucose management, the ideal number of repetitions of an exercise is between 10 and 20, although this may decrease with increasing load and strength.
- **Sets** This means the number of times a set number of repetitions ('reps') is repeated. In general, one set of 10–20 reps is all that is recommended for blood sugar management, in contrast to weight training for body building where up to 6 sets may be carried out.
- **Repetition maximum (RM)** This is the maximum amount of weight that can be lifted a set

number of times. For example, a '10RM max weight' is the maximum amount of weight that can be lifted 10 times. The '%RM' is the percentage of this weight which is used for the exercise, for example, '50%10RM' means 50 per cent of the weight that can just be lifted 10 times.

- **Rest** Muscles require different amounts of time to recover after a loaded work-out. In general this means only carrying out resistance exercise for the same muscle groups at least every other day. Three days of resistance training a week is therefore usually all that is recommended at the beginning stage, given that other general movement is also being increased.

WHY RESISTANCE TRAINING?

Muscle makes up the largest portion of non-fat body tissue. Without muscle we would not be able to move. Each muscle in the body (and there are more than 400 of them) has a function in some action of movement. All skeletal muscles work by contracting (pulling). The connection of a muscle to two separate bones (across a joint) results in one bone being pulled towards the other, such as the forearm being raised when the biceps contracts, or shortens. No muscle works by pushing.

To contract (that is, to work), the muscle needs energy, which is obtained from the sugars or glucose in the blood. As we have seen, the main problem in diabetes is excessive sugar in the bloodstream because insulin is ineffective in helping the body cells take sugars up. By using up large amounts of energy, muscle is able to 'soak up' blood sugar and thus assist the available insulin in disposing of it. Once you understand this, you can see

why the most effective exercises for blood sugar control will be those that use the large muscles, or many muscles of the body under load. For that reason, and for the most economical use of time, a resistance program for blood sugar control should involve what is known as 'compound' exercises—exercises which use many muscles—and/or exercises which use the large muscles, such as the quadriceps in the thighs, the latissimus dorsi in the upper back, or the deltoids in the shoulders.

A SPECIFIC TRAINING REGIME

Routines to meet the requirements just discussed can be developed using just a small number of exercises. One example would be the following routine using five BASIC exercises (BASIC is—almost—an acronym for the five exercises):

1. **Bench press** This uses the muscles of the upper body—the pectorals, triceps, deltoids, etc. It involves lying on a bench and extending the arms to raise a weight above the chest.
2. **Abdominal curl** Otherwise known as the 'sit-up', this should be done with knees bent, raising the shoulders, head and as much of the upper body as possible off the floor while keeping the feet flat on the floor. It uses all the muscles around the trunk.
3. **Squat** Squatting into a position where the thighs are parallel to the floor, then rising to stand up straight, is sufficient to work the largest muscles of the body, the quadriceps. A weight can be carried on the shoulders as dumbbells.
4. **Lateral pull-down** This requires the use of a machine where a weight attached to a cable is pulled

down behind the neck to exercise the large latissimus dorsi muscles in the upper back.

5. **Clean** The clean is one of the best all-round compound exercises available. It is one of the three major exercises in Olympic weightlifting. The clean is a difficult technique to learn and should only be attempted under professional supervision.

PUTTING IT ALL TOGETHER

Resistance training should be carried out as well as, not instead of, other planned aerobic activities such as walking. Because every individual has different needs, resistance training should only be undertaken under the guidance of an experienced weight coach or trainer. Professor Trim's weight coaches are available to work with your Professor Trim's doctor if required. Otherwise a qualified fitness leader should be sought to plan a progressive introduction to this type of training.

WHAT IF YOU HAVE DIABETIC COMPLICATIONS?

In performing resistance exercise, it is possible that your blood pressure will increase marginally. This is generally not a problem except in the presence of some types of complications from diabetes. Two complications in particular may affect how much you can do in the way of resistance exercise—diabetic eye disease (also called retinopathy) and diabetic kidney disease (nephropathy). Significant (even if transient or short-term) rises in blood pressure can worsen both these conditions; you must check with your doctor for clearance before starting resistance exercise if you are affected.

Professor Trim's Prescription Pad

- Look at resistance training as a potential aid to weight control and blood sugar management.
- Get a weight coach or fitness leader to teach you weight training techniques.
- If possible, carry out resistance training up to 3 times a week, but no more than this.
- Check with your doctor for clearance to do resistance training.
- Do resistance training *as well as*, rather than *instead of*, other aerobic activity.

Chapter 8

EATING YOUR WAY TO A LOWER WEIGHT (AND LESS BLOOD SUGAR)

In general, the nutritional principles for the control of diabetes or high blood sugars are the same as the nutritional principles for weight loss or weight management, and for good health in general. In essence this means:

- Limiting the total number of calories (or kilojoules);
- Not eating too much;
- Eating regularly (three meals a day);
- Eating a wide variety of foods for a balanced nutrient intake;
- Not skipping meals, or following an overly restrictive diet;
- Limiting rich, high energy-dense foods; and
- Eating more low glycaemic index (GI) foods (as long as you do not increase your total calorie intake).

FOOD VOLUME AND WEIGHT LOSS

Despite the hype about different types of diets for weight loss, as with exercise the issue of diet basically boils down to the *volume* of food consumed in terms of total energy (calories or kilojoules), where:

Volume = Energy density (kcals/g) × portion size (g)

Within this formula there are changes to diet, which we consider below, which help to improve the quality of the diet as required for blood sugar control. In the first instance, however, we'll consider what makes up volume.

ENERGY DENSITY (ED)

'Energy density' is a relatively new term, referring to the number of calories (kilojoules) per gram of food. Sometimes it's not just fat which adds to total calories, but high quantities of sugar and/or fat. Energy density (ED) is calculated by dividing the number of kilojoules (kJ) in a food by the number of grams of that food. Where ED turns out to be more than 12kJ per gram of food (2.8kcals/g), you are looking at a high energy dense food that should be avoided. A food with an ED of 7.5–12kJ/g is medium energy dense. An ED below 7.5kJ/g means a food has low energy density and can be eaten in (almost) unlimited quantities. (For a summary of foods and their energy density see Professor Trim's *Ultimate Food Energy Guide*.) The energy densities of fat content of some well-known low fat foods are given in the table below.

Examples of low fat but high energy dense foods

Food	Fat (g/100)	ED (kJ/g)	ED kcals/g
Biscuit: savoury crispbread, puffed and toasted	3.8	16.1	3.8
Biscuit: fruit, polyunsaturated fats, wholemeal	9.9	15.9	3.9
Bread, melba toast	4.9	16.0	3.8
Breadstick, hard	3.8	16.3	3.9

Examples of low fat . . .cont'd

Food	Fat	ED	
	(g/100)	(kJ/g)	kcals/g
Breakfast biscuit, wholewheat, bran	7.6	14.9	3.5
Cereal, mixed grain, sugar >35%, fortified	4.2	16.1	3.8
Confectionery, carob-coated, sugar	9.9	17.5	4.2
Cornflakes	0.5	15.6	3.7
Fudge, not chocolate, plain	4.2	16.1	3.8
Muesli, toasted	9.8	16.2	3.9
Mousse, low fat, chocolate, artificially sweetened	5.0	16.3	3.9
Popcorn, air-popped, no added fat	4.2	14.8	3.5
Pretzel, regular	7.2	15.8	3.8
Rice cake, natural, brown	3.4	15.6	3.7
Rice cake with corn and sesame	2.5	15.0	3.9
Turkish delight, chocolate-coated	9.8	16.6	4.0

PORTION SIZE

Portion size refers to the amount of food eaten in a sitting. Recent research has shown that the bigger the portion of food supplied in a meal, the more food is eaten over the course of a day. In other words, most people do not adjust for larger portion sizes by decreasing their total intake. Decreasing portion sizes and maintaining them at a smaller level is vital to body weight and blood sugar control.

Fast food manufacturers have capitalised on this. Because the added cost to the food supplier of offering bigger portions is minimal compared to the higher price they can charge the consumer, extra profits are there for the taking. The standard size of a McDonald's serving has increased by around 50 per cent over the last decade. Soft drink manufacturers have added extra amounts to their

drinks, and other fast food suppliers have kept pace. So when asked if you'd 'like extra fries with that?', respond definitely in the negative.

OTHER NUTRITIONAL FACTORS

Other factors to look at in a diet for weight loss and blood sugar control include reducing total energy consumption, reducing the intake of dietary fat, increasing the intake of dietary fibre and the proportion of protein, eating regularly, and eating low glycaemic index foods. We consider each in turn.

REDUCING TOTAL ENERGY

Total energy (calories) intake is the factor ultimately influencing weight. For long-term weight loss it is appropriate to reduce total energy by up to 500kcals a day. This can be done in a number of different ways, but those discussed below are likely to be the most acceptable and healthy methods.

REDUCING DIETARY FAT

Reducing fat intake is the easiest way of reducing total energy intake. There are 9 kcals of energy per gram in fats and oils (remember oil is just a liquid form of fat) and only 4 calories per gram in carbohydrate and protein. Reducing fat is important for other reasons too: (a) it is easy to passively overconsume, (b) it can be quite 'addictive', and (c) it is widely available in modern processed foods. There are two main types of fat: saturated (mostly of animal origin) and unsaturated (mostly of vegetable origin).

In general, all fats should be reduced for weight loss. However, the greatest emphasis needs to be put on

reducing saturated fats, particularly for diabetes control. Here are some simple ways of reducing fat intake:

- *Don't use spreads like butter and margarine (or at least spread them thinly)* While some of the new designer margarines may help your cholesterol, they're still up to 80 per cent fat (at 9 kcals/g) and just serve to add to your weight woes.
- *Take the skin off the chicken* Birds store fat under the skin. Animals store it more throughout the muscles. Take the skin off before cooking so you're not tempted afterwards.
- *Don't fry food in butter or oils* Grill, bake, boil, steam . . . whatever you like. Frying in oil means that the 9 kcals per gram of oil are soaked up by the food and ultimately stored on the body.
- *Cut the fat off the meat* Generally fat on meat is easy to see. It's the white bits around the outside of the T-bone and the grainy white bits you see marbled through some cuts of red meat. Go for low fat meats, which are generally whiter meats like veal and pork and trim lamb. Otherwise trim all the fat off before cooking—it's easier than cutting it off afterwards, and removes the temptation.
- *Avoid full cream dairy products* Cheese and full cream dairy products are large sources of fat. Milk can be modified by going for the low fat versions (preferably with added calcium), but it's hard to get a true low fat cheese. Cheese should be eaten in moderation, if at all.

What is low fat?

To take the low fat issue further than just following these five tips, you'll need to understand a bit about fat. There

are a couple of simple rules to work by. The Professor Trim program stipulates that you should:

- *Avoid foods with more than 10 per cent fat.* How do you know if a food is more than 10 per cent fat? Look for Professor Trim's *Ultimate Food Energy Guide* at any bookstore. (One is supplied with each full Professor Trim program.) This will tell you the number of grams of fat per 100 grams in a stack of different foods. If the fat in a food is more than 10g/100g (i.e. 10 per cent), avoid that food. In fact, don't even keep it in the house.
- *Reduce daily fat intake* Again, from your *Ultimate Food Energy Guide* you can check on just how much fat you are eating. Check the quantity of each food eaten and the number of grams of fat. Then try to reduce your daily fat intake to around 30g a day or less.

Polyunsaturated and monounsaturated fats

There is accumulating evidence that an increase in monounsaturated fats such as olive and canola oil may have positive benefits for blood sugar control—and even for body weight. Some research shows similar effects for some of the polyunsaturated fats. However, this research is in its early days; at this stage care should still be taken to reduce consumption of all fats.

INCREASING DIETARY FIBRE

Fibre is mostly the 'stringy' part of foods, like the bits of an orange that hold it together, or the bran on the outside of a grain. There are different types of fibre, but for our

purposes here we'll consider them as one and make the assumption that most high fibre, low energy dense foods, such as fruits and vegetables, come from plants. However, fibre does also exist in some manufactured foods such as bread, pasta and cereals.

By increasing fibre intake you'll decrease fat intake and thus have a double effect on body weight. A simple formula is to eat at least three different fruits and four different vegetables a day, and to increase your intake of pasta, breads (without spreads) and cereals.

INCREASING THE PROPORTION OF PROTEIN

Protein is muscle food. It is found in the muscles of the animals we eat, but other good, low fat sources are beans, legumes and some other vegetables. Protein is of particular importance during pregnancy because of the need to create new body tissue.

Because protein goes into muscle in our bodies, and muscle is active, it helps to increase metabolic rate—provided the consumption of protein is combined with exercise (see Chapter 9). Protein is generally not turned to fat, because any excess is lost as heat or passed out through the urine. It's important that it's the *proportion* of protein in the diet that is increased, not necessarily the *total amount*. This won't generally mean eating more food. It's also important to make sure that any increase in protein comes from low fat sources, such as those listed in the table.

Seafood is a good source of protein, which has benefits for blood fats like cholesterol. Recent research has shown that seafood improves birth outcomes in pregnant women. Two or three seafood meals (not fried) per week

should be a standard recommendation for good health and weight management.

Some low fat sources of protein

Seafood	Vegetables	Meat
Fish (most kinds)	Legumes	Kangaroo
Prawns	Lentils	Crocodile
Lobster		Lean beef
Crab		Lean pork
Squid/octopus		Trim lamb
Oysters		Chicken breast
		Lean beef

EATING REGULARLY

Eating regularly doesn't mean eating more. It can mean eating less, because regular meals satisfy hunger better. Research suggests that eating several small meals a day, instead of one or two large meals, will decrease cholesterol in the blood and maintain a higher metabolic rate (a reduction in metabolic rate is what we see when people skip meals). In particular, don't go without breakfast. If possible, try to eat at least every four hours—but make sure any snack is something healthy, like fruit.

EATING LOW GLYCAEMIC INDEX FOODS

Glycaemic Index (GI) is a relatively new term used to explain the rate of absorption of food into the bloodstream. Foods that have a high GI are absorbed quickly and converted to blood sugar. This can have a negative effect on diabetes as it raises blood sugars rapidly without allowing them to be taken into the body cells. High

GI foods are also thought to have less effect on satiation than low GI foods and hence may not be as good for long-term weight control. Even if you are eating mostly low fat, low GI foods, you still need to make sure that you're not increasing your total energy intake.

SUMMARY

The main issue in relation to nutrition for weight control or weight maintenance is reducing the total volume of food, where volume refers to the energy content of the food (whether measured in calories or kilojoules). Volume can be reduced in a variety of ways, and no one technique is universally better than any other. However, the most effective ways of managing food intake involve following one or more of the methods discussed above.

Professor Trim's Prescription Pad

- Try to reduce the total food energy in the diet.
- Do this firstly by reducing fat and sugars and increasing fibre.
- Increase the proportion of low fat protein in the diet.
- Increase the variety of foods to more than 40 different foods a week.
- Don't miss breakfast; don't go for longer than about four hours without something to eat.
- Don't use butter and margarine (or spread it thinly).
- Take the skin off the chook or turkey and cut any fat off meat—before you cook it.
- Don't fry foods in oils or butter.
- Avoid full cream dairy products.

- Avoid foods with more than 10 per cent fat; check labels for fat content.
- Eat more low energy dense and less high energy dense foods.
- Eat less total food.
- Recognise genuine hunger and don't respond to 'learned appetite'.

Chapter 9

STRESS AND DIABETES

Stress is the third component that needs to be considered in any weight management program for diabetes or blood sugar control.

But what has stress got to do with diabetes? Or body weight?

STRESS AND DIABETES

Although there's less evidence for a link between diabetes and stress than there is for the links with inactivity and diet, research is starting to accumulate more and more support for it. High levels of stress and/or anxiety are now known to make it more difficult to keep blood sugars within the normal range. Why this is so is not absolutely clear. However, it could relate to the traditional 'fight or flight' response to a dangerous situation. Where this stress response was required from our hunter-gatherer ancestors, blood sugars were mobilised from the liver and the muscles to provide the necessary energy. The blood sugars would have been used up in the action. In modern cases of stress we tend to just 'stew in our own juices' because there are no acceptable avenues for fight or flight. This may tend to add to the instability of blood sugar levels. In any case, understanding stress and developing techniques of dealing with it is not likely to be a liability and could help your passage through life.

STRESS AND ENERGY BALANCE

While identifying stress as a problem, it's not stress in itself that's the issue. Indeed, stress can increase the metabolic rate, cause increased nervous fidgeting and result in other stress-related activities and movements, all of which help to burn energy and therefore fat. But in many people, women especially, it's another reaction to stress that is the problem and makes them gain weight—comfort-related eating. If as a child you were given food as a source of comfort whenever anything went wrong, overeating as a response to stress could be a normal reaction; it's understandable why you'd reach for the feedbag in adulthood whenever you're faced with any disruption to normal daily bliss.

STRESS AND BINGE EATING

Among inveterate dieters, response to a stressful situation can be far worse than comfort eating. Around 50 per cent of strict dieters, or 'overly restrictive eaters', are also binge eaters. That is, they don't just eat when confronted by stress—they over-eat! Critical life events such as marriage, divorce, job changes, childbirth, grief, and many other situations, can all lead to temporary stress and hence over-eating among binge eaters.

If you react in this way, learning new ways of coping with stress is important for you. On the other hand, those people who eat less and become more active when stressed have no real need to consider stress management in their weight loss program.

Obviously, in a short publication like this we can't deal with the problem extensively. We provide the basics; if you are interested you can follow up on the topic in more detail through the full Professor Trim program.

WHAT IS STRESS ANYWAY?

The term 'stress' is not really accurate; in engineering terms it implies a process rather than an outcome. A better word might be 'strain', referring the effects of ongoing exposure to a stressor (stressful situation).

Like strain on an engineering structure, stress will have little effect if the object being stressed is strong enough to withstand that stress. But strain can cause total collapse if the object being stressed is weaker than the severity of the stressor.

A similar thing happens in people. Strain in this case has its effect on the psychological 'structure' of the individual, the 'stressee'. If the capacity of the stressee is greater than the severity of the stressor, stress or strain is not an issue. In fact, if the stressor is too weak it can even lead to boredom. If, on the other hand, the capacity of the person being stressed is less than the severity of the stress being applied, anxiety and its consequences (such as over-eating) are the outcome.

The implications of this are that everyone has their own 'red line', above which stress becomes an issue—and this may differ for different kinds of stressors. Your red line for stressors in the family, for example, such as the relationship with a partner, may be low, whereas your red line for work stresses may be much higher.

The first lesson of stress management therefore is to recognise your own red line and try to keep just below it to get the benefits without the costs—that is, to find what American psychologist Mihaly Csikzentmihalyi calls the 'flow channel'. You've probably heard this concept expressed in several different ways—for example, 'If you can't stand the heat, get out of the kitchen', and 'Don't sweat the small stuff—remember it's all small

stuff'. Recognising your red line can help you go a long way towards dealing with stress.

STRESS AND CONTROL

The concept of stress is synonymous with a 'lack of perceived control'. If you think you have control of a situation, stress is unlikely to be an issue. Where you *think* you have lost control, however (whether you *actually* have or not), stress can start to play havoc with your psyche. Again, if you are a typical dieter, or 'overly restrained eater', the reaction is likely to be to forget all this and binge—to make up for lost time!

For this reason, dieting and inflexibility are the two worst characteristics in a person trying to maintain a weight-loss program. Being too restrictive in your eating habits, and being unable to cope with life's little ups and downs, are likely to shake the foundations of a weight loss program to the point that over-eating—and consequent weight gain—becomes the rule rather than the exception.

The key then is to regain control over the situation—or at least 'perceived' control. And instituting some form of 'escape', either physical or mental, is really the only way to do this.

'ESCAPE' AND CONTROL

'Escape' is often regarded as a negative way of dealing with a situation. It's the coward's way out. But in the sense in which we are talking here, escape is not only an effective solution, it's possibly the only solution.

This doesn't necessarily mean physical escape. While physical escape might be effective, as our ancestors found

when faced with a frightening stressor, it's not always the most effective option today. In the first place, it's often not possible to physically flee an oppressive boss or a bad family situation. Most stress, however, doesn't come from an outside stressor, it comes from our way of thinking about things. In those cases escape doesn't need to be physical; it can be found in learning techniques of mental escape, such as meditation, negotiation and relaxation, and in other ways such as exercise, massage or taking a holiday.

Finding the best type of escape to enable you to get through those critical periods that may lead to over-eating and inactivity is the key to managing stress. Recognising what works for you will be part of helping you better control your blood sugars.

Professor Trim's Prescription Pad

- Beware of the effects of stress on over-eating.
- Become aware of your reaction to stress and the effect it has on your weight.
- Learn techniques to cope with 'critical periods' of stress.
- Try to stay under your stress 'red line'.
- Recognise stress as resulting from a perceived lack of control.
- Attempt to regain perceived control where this is missing.
- Learn techniques of physical and mental 'escape' to restore control.

Part 3

Specific considerations

Chapter 10

SPECIAL REQUIREMENTS AND ALTERNATIVE APPROACHES IN DEALING WITH DIABETES

Weight loss for diabetes and blood sugar control is little different to weight loss in general. However, there are other aspects of dealing with diabetes which are daily considerations, such as caring for your feet, and accurately timing exercise and meals to prevent low blood sugars (hypoglycaemia) occurring. In addition, if you have complications such as eye disease (retinopathy), kidney disease (nephropathy) or peripheral nerve damage (neuropathy), you will need to take precautions to prevent these conditions worsening.

CARE OF FEET

It is important to always wear comfortable, soft shoes when walking or exercising, with absorbent cotton socks. Your feet should be inspected daily (using a mirror on the floor if you can't bend easily). Any blisters which may develop need to be protected. You should see your doctor if the blister is not healing rapidly or if any redness appears.

PREVENTING LOW BLOOD SUGARS (HYPOGLYCAEMIA)

Low blood sugars can result from physical activity because of the greater efficiency of your insulin after exercise. This could be a problem if you are on medications such as sulfonylureas, or on insulin. It may be necessary to eat a snack such as a piece of fruit or a plain biscuit, either before or immediately after exercise, to prevent low blood sugars. Because you are also trying to lose weight, another option may be to reduce your diabetic medication. Seek advice from your doctor before making any dose changes.

Also, make sure you drink plenty of fluids, such as plain water, to avoid dehydration. The special electrolyte drinks on the market are not necessary; as they often contain many sugar calories, they are undesirable from both the blood sugar and body weight perspectives.

PERIPHERAL NEUROPATHY

If you have nerve damage in the feet, it is especially important to wear well-fitting, properly designed shoes that are suitable for exercise. It would be a good idea to show your shoes to your doctor or podiatrist to check that they are OK. Exercise that places a lot of unnecessary pressure on feet and joints should be avoided—this would include jogging, jumping, and the types of exercise that might be done in an aerobics step-class.

RETINOPATHY AND NEPHROPATHY

If you have the eye disease called retinopathy, you should avoid exercises that are likely to raise your blood pressure, like weight lifting. Exercises such as walking, tennis,

swimming and other aerobic activities, on the other hand, are completely acceptable.

Similarly, if you have kidney disease (nephropathy) or have been found to have protein in your urine, exercises which increase blood pressure should be avoided.

VERY GRADUAL PROGRESSION

It is important to start slow and gradually increase the frequency, duration and intensity of your physical activity. Remember, Rome was not built in a day. As you lose weight, physical activity will become easier, so don't worry too much if you find physical activity difficult or uncomfortable at first. Things will improve with time.

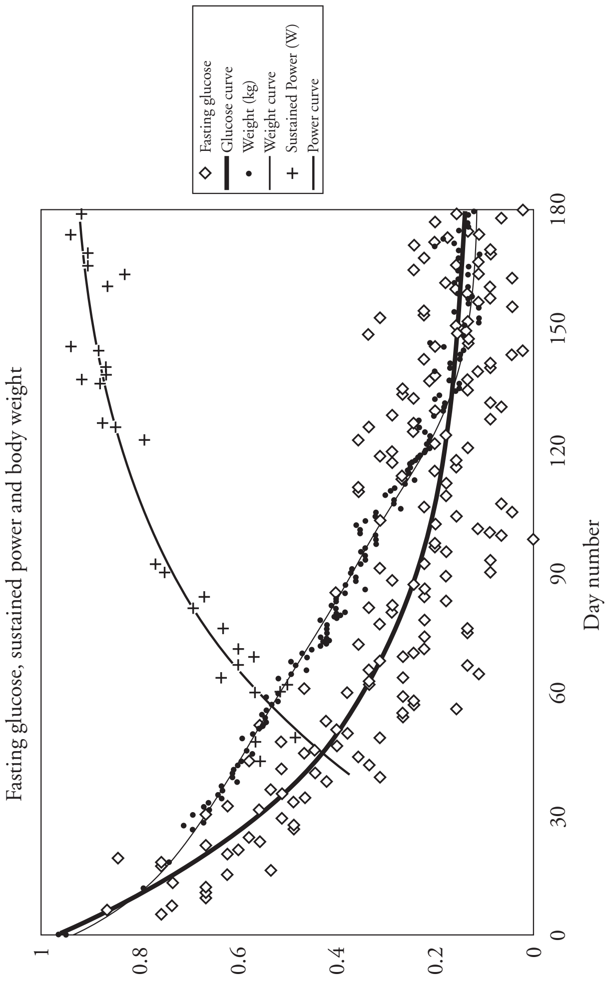
A good rule of thumb is to exercise at a level where you can talk comfortably, although you might puff between sentences. This would have you working at around 50–60 per cent of your aerobic capacity. As your fitness level improves, you will be able to perform more intense exercise without puffing too much. Hang in there—it will take a little time, but you'll get there.

THE POSITIVE SIDE

Type 2 diabetes is a lifestyle-related disease. It is nature's warning that the environment in which we live has got out of hand. In modern western societies, it means using too much effort-saving technology, eating too much, and eating the wrong kinds of foods. But—because diabetes is lifestyle-related, it is possible to make changes to correct the situation. Even in an environment that promotes obesity and encourages the development of diabetes, lifestyle change, and particularly weight loss and increasing physical activity, can be achieved. If blood sugar problems

are caught early enough, behavioural changes can lead to long-term improvements in health and longevity.

This graph illustrates what can be done to alleviate diabetes by making lifestyle changes.



The three curves represent the blood sugar readings, body weight and fitness scores (as measured on an exercise bicycle) of a man diagnosed as diabetic who decided to apply a lifestyle change rather than a medication option to his problem. The graph shows that from an initial blood glucose reading of 18mmol/L (where normal lies between 5–6.9mmol), and body weight of 110kg (where the desirable weight for his body type lies between 75–80kg), his scores were reduced to regular, lower, acceptable levels after about three months of exercise and dietary changes while his fitness level continued to improve. In essence the patient had normalised the diagnosis of 'diabetic'.

The lifestyle prescribed for the diabetic sufferer is that normally prescribed for good health. Hence, while coming perhaps from the wrong end of the management option, diabetes can be seen to have positive signs, providing the warning bells are rung and responded to early enough.

This booklet is an attempt to help you manage diabetes and blood sugar problems without resorting to medication. And while this may not always be possible (and should only be done with the knowledge of your doctor) it can, in many cases, save years of expense and misery. If we have been able to encourage you to make lifestyle changes in this brief introduction to self-management, we have achieved our goal. If you have been stimulated to go on and achieve more, you can progress to the full Professor Trim program by referring to the information in the Appendix.

FINALLY—SOME ALTERNATIVE APPROACHES

You may have got to this point still wondering, 'isn't there anything easier for weight loss?'

Indeed, there are many easier approaches—for weight *loss*. But if you want to *keep weight off* over the long term, the simple answer is 'no'. Effective weight loss maintenance requires changes in both lifestyle and behaviour. There are other approaches that can serve as an adjunct to weight loss management, including drugs which can help with blood sugar control, but the basis of all improvement is a change in lifestyle. Experts have estimated that with optimum long-term diet and exercise therapy, and achievement of ideal body weight, less than 1 in 10 of all type 2 diabetes patients would require medication. And given that better control of blood sugars leads to fewer diabetic complications, this implies that lifestyle change will result in much less progression of your disease.

A review of all the available research shows that alternative 'quick fix' treatments such as over-the-counter medications are of little value, so don't waste your money.

There are some techniques that may help, however, including:

- **Pre-packaged meals** Low energy meals such as those provided by the Lite N'Easy organisation can help keep food intake down to a pre-set level; they also provide convenience in a weight loss program.
- **Very low energy diets** These are usually powdered meal replacement 'shakes' or drinks. They can have big, quick effects if taken under strict supervision, as with a Professor Trim doctor. However, there is potential for quick weight regain if these diets are not used properly.
- **Medication** Medications like Reductil, Xenical and Duramine, and even some anti-depressants,

can be useful under some circumstances. Talk to your doctor about these.

- **Surgery** Bariatric surgery, which restricts the amount of food that can be eaten, is one of the most effective forms of quick weight loss and often a last resort for very big people.

All of these approaches are considered in more detail in the full Professor Trim program.

Professor Trim's Prescription Pad

- Take care of the feet if involved in any exercise program.
- Check with your doctor before undertaking any exercise program if you have been diagnosed as having eye or kidney problems.
- Work consciously to manage your blood sugar problems with lifestyle changes, particularly a reduction in body weight.
- If weight loss is not happening through the standard methods, consider some of the acceptable alternative options.
- Follow up this introduction to weight loss with the full Professor Trim program for long-term weight loss maintenance (see details next page).

APPENDIX PURCHASING PROFESSOR TRIM'S ADVANCED PROGRAMS

Professor Trim's is a series of medically supervised weight-loss programs with

(a) minimal supervision ('Quick Start') programs for:

- *families*,
- *new mothers and mothers-to-be*, and
- *diabetes and blood sugar control.*

(b) medium supervision programs over 3–12 months for:

- men ('*Becoming Gut Less*'), and
- women ('*Becoming Slimmer*').

and (c) intensive supervision programs for:

- *the long-term and very overweight.*

All programs can be carried out at home alone, or on a shared care basis with your local GP and (if required) a fully qualified personal weight coach (PWC).

Professor Trim's Programs Offer

- A balanced, medically supervised approach to weight loss.
- No diets, tricks, fads, gimmicks—just up-to-the-minute scientific sense.
- Individualised care.
- Concentration on long-term maintenance, not just short-term losses.
- Twelve months' care and supervision with the PT team and your GP.
- Toll-free phone advice as needed.

For more information or to purchase a Professor Trim's medium or intensive supervision program, visit the Website on www.professortrim.com or ring toll free on 1300 768 300.